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Australian Construction Industry Apprentices' Alcohol Use and its Relation to their Experiences of Alcohol-Related Harm

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Abstract

This study reports on the prevalence of harmful alcohol use in a sample of male Australian construction industry apprentices, and also discusses alcohol-related harms. Data was gathered from 108 male construction industry apprentices (predominantly 15-25 years of age). Findings indicate that approximately two thirds (65.7%) of apprentices had an AUDIT (Alcohol Use Disorders Identification Test) score over 8, which place them in a 'harmful' alcohol consumption category. There was a positive correlation between 'harmful' alcohol consumption and numerous alcohol-related behavioral harms. Thus, what is clear is that the greater apprentices' score on the AUDIT test (which measures their harmful alcohol consumption), the more likely it is that they will experience alcohol-related behavioral harms, including missing classes, drunk driving, risky sex, memory loss, poor physical health, expressing verbal, physical and racial abuse, physical injuries, property damage, poly-substance use, relationship difficulties, financial difficulties and dangerous behavior. We can conclude that this is a high risk group for alcohol-related harms, and as such the paper makes suggestions for implementing focused preventive strategies in apprentices training environments and workplaces.

Keywords: Alcohol; Alcohol-related harms; Occupational health

Introduction

Construction industry apprentices are predominatly male between the ages of 15 and 25 years. They are new entrants to the industry, who have to become accustomed to the responsibility of workwhile balancing the training requirements of their apprenticeship. For many young apprentices their period of apprenticeship can also coincide with a life stage transition (e.g., including moving out of home; managing money; establishing intimate relationships) [1]. This transition is often not linear, and this period can bring changes that heighten their vulnerabilities and associated risks [1]. This period of transition can also correspond with a developmental stage, which may include experimenting with alcohol and drugs, that typically "peaks during the period of mid-to-late adolescence" [2]. For some,consumption of alcohol may also become a rite of passage into adulthood [3].

Coupled with age are the risks associated with male gender. Men's consumption of alcohol is often more harmful than women: The most recent Australian data indicates that between 2007 and 2008 a higher proportion of men over 18 years consumed alcohol at 'riskier' levels (15%) than women (12%) [4]. Alcohol use disorders are also highly prevalent among young adult males [5]. Young male workers can be viewed as particularly vulnerable. Pidd et al. [6] found that in general "workers who were younger, male, never married, frequent drinkers and had no dependent children", were more vulnerable to the risks associated with harmful alcohol use, than other workers.

Pidd et al. [7] note that the workplace is a "distinct cultural environment that exists within the wider community, and as such can either support or inhibit alcohol use". The Australian construction industry is described as "strongly masculine in culture" [8]. The work "is often demanding, stressful, and dangerous". Work can be unstable as workers are often employed on short-term contracts, and in these types of "masculine workplace cultures, workers may respond by drinking, drug taking or gambling" [8]. No causal link has been established between the construction industry *per se* and harmful alcohol consumption. However, previous studies indicate that compared to to other industries alcohol consumption in construction, hospitality, mining, and retail, is elevated [7]. Harmful substance use can contribute to low levels of productivity and absenteeism [9], and it also has implications for safety and workplace injuries [10].

'Harm' relates to adverse health outcomes, which in the context of this study includes "diseases and/or injury resulting from consumption of alcohol" [11]. There are numerous costs (including social, health, economic and personal) associated with harmful alcohol use, both in the short- and long-term. Many of these costs are particularly detrimental for young men. For example, harmful drinking has been estimated to cause 31.5% of all deaths in 15-29 year old men in the developed world [12]. Of further concern is that patterns of harmful substance use established in adolescence are often stable, so that they can predict long-term patterns of use, as well as morbidity later in life [12]. Alcohol use has been causally linked to over 60 medical conditions, including heart problems, increased risk of cancers and cirrhosis of the liver, and is associated with co-morbid substance use and mental health disorders [13]. Excess alcohol consumption is associated with injury, violence and motor vehicle accidents, and also affects concentration, lowers

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inhibitions and impairs judgment [13]. Harmful levels of alcohol consumption are also associated with a range of adverse effects on others [14], such as families, communities and workplaces, including intimate partner violence, violent crime and neglect of children [13]. Given that alcohol consumption has significant implications for safety in the construction industry workplace, and the propensity for potential risk associated with harmful alcohol use (coupled with age and gender, as discussed above), there appears to be a need to develop a specific understanding of the types of risks and harms associated with 'harmful' alcohol use in male construction industry apprentices. As such, this study reports on the prevalence of 'harmful' alcohol use (as measured by the AUDIT) in a sample of male Australian construction industry apprentices, and also discusses the risks and harmful behaviors associated with 'harmful' alcohol consumption.

Methods

Data were gathered in Victoria, Australia from carpentry and plumbing apprentices through a paper and pencil survey, handed out during preventive education session in apprentices' trade training colleges. No differences between the two groups of apprentices were discernible, and as such the data from the two groups were combined. All 108 apprentices who were approached completed the survey. Participation in the study was voluntary and anonymous, and consent to participate was implied by return of the completed survey. While a small percentage (<1%) of construction apprentices are usually female, all participating apprentices were male, and as such the findings of the project are limited to male apprentices. Participants' educational status prior to beginning their apprenticeship was not known. The majority (75%) of participating apprentices were in the second year of their apprenticeships (Table 1). The questionnaire included the 10-item Alcohol Use Disorders Identification Test (AUDIT) [15]. The AUDIT was developed by the World Health Organization to assess alcohol consumptionbehavior, adverse reactions, and alcohol-related problems; total scores can range from 0 to 40, with scores of 8 or more indicative of hazardous or harmful alcohol use [15]. The survey also asked apprentices a set of questions around whether they had experienced any of the 21 listed alcohol-related harms (Table 2) in the last year, to which they could answer "Yes" or "No"[14]. The research followed the organization's ethical guidelines and the principles in the Declaration of Helsinki. Data were analyzed using SYSTAT 12 to examine descriptive statistics as well as correlations between variables of interest.

Participant Demographics	%
Gender	
Male	100
Type of apprenticeship	
Carpentry apprentices	61
Plumbing apprentices	39
Apprenticeship year	
Pre-apprenticeship	4
1st Year	1
2nd Year	75
3rd Year	19
4th Year	1

Table 1: Participant demographic data (N = 108)

Results

The mean presentation of 108 apprentices' AUDIT Scores was 9.6 [SD = 5.7], with 7 apprentices having a 0 score and 1 having a score of 26. The AUDIT cut-off score for harmfulalcohol consumption is 8. Of interest are the specific questions relating to the amount and frequency of consuming alcoholic beverages.With regards to the frequency of consuming alcohol (item 1 of AUDIT), almost 40% of the 108 apprentices report consuming alcoholic beverages 2-3 times per week, with another 31% consuming alcohol 2-4 times per month. However, 10% never consume alcohol, and 14% consume alcohol monthly or less than monthly. With regards to the amount of alcohol consumed (item 2 of AUDIT), most apprentices surveyed (36%) reported that they consume 10 or more alcoholic beverages on any one occasion, or 7-9 alcoholic beverages in any one occasion (22%).The rest of the apprentices consume 1or 2 alcoholic beverages on any occasion (13%), 3 or 4 alcoholic beverages on any occasion (15%), or 5 or 6 alcoholic beverages on any occasion (14%). With regards to consuming 6 or more alcoholic beverages per occasion (item 3 of AUDIT), most apprentices (41%) reported consuming 6 or more alcoholic beverages on any one occasion *on a weekly basis*, with 22% doing this monthly; 21% do this less than monthly, and 16% not ever doing this.

In addition to using the AUDIT score on a scale, the AUDIT score was also split into two categories which depict (a) 'harmful'alcohol consumption practices, and (b) 'safer'alcohol consumption practices. When looking at their overall AUDIT score, almost two thirds of apprentices (65.7%; *n*= 71) had 'harmful'alcohol consumption practices (> 8 on the AUDIT scale), while 34.3% of apprentices (*n*= 37) had AUDIT scores of less than 8, and did not have 'harmful' alcohol consumption practices.

Not all the apprentices who consume alcohol at 'harmful' levels (71 in the sample of 108 apprentices) experienced the full range of alcohol-related harms measured in this survey (Figure 1). Across the board they did experience a number of alcohol-related harms, even if they were consuming alcohol at 'safer' levels. However, compared to apprentices who were not drinking at 'harmful' levels, the apprentices drinking at 'harmful' levels experienced more alcohol-related harms.

Overall, there were positive Spearman correlations (Table 2) between apprentices' AUDIT scores and alcohol-related harms. Thus, what is clear is that the greater apprentices' score on the AUDIT test (which measures 'harmful'alcohol consumption), the more likely it is that they will experience alcohol-related harms, including missing classes, drunk driving, risky sex, etc. To extend this, it would appear that the frequency at which apprentices consumed 6 or more alcoholic beverages on any one occasion (item 3 AUDIT Scale) was positively correlated (Spearman correlations) with a number of alcohol-related harms. Similarly, the amount of alcohol that apprentices consume on a typical occasion (item 2 AUDIT scale) was also positively correlated with alcohol-related harms

Discussion

Apprentices were asked whether they had experienced any of the 25-listed alcohol-related harms on the questionnaire over the past year (Table 2). Sixty six percent of apprentices in the current study were drinking at harmful levels (as measured by the AUDIT scale). However, one of the limitations of the study was that the data was gathered through self-report from Australian apprentices. While adequate for statistical analysis, the sample size was such that care should be taken to generalize the findings to all apprentices, in particular to apprentices

Alcohol-related harms	Proportion (%) experiencing alcohol-related harms	Spearman correlations with AUDIT score	Frequency of consuming 6 or more drinks on one occasion	Amount of alcohol on one occasion (scale of 1-2 drinks to 10+ drinks)
Missed a class at training college	6.5	0.317**	0.230*	0.199*
Poor performance at training college	14.8	0.333***	0.403***	0.099
Driven a car after drinking too much	21.3	0.426***	0.478***	0.249*
Had unprotected sex with a casual partner	26	0.431***	0.290**	0.131
Had unprotected sex with a regular partner	28	0.256*	0.083	0.137
Had a sexual encounter you later regretted	19	0.189	0.253*	0.099
Ended up in a sexual situation you weren't happy with at the time	7.4	-0.055	0.021	0.020
Vomited	56	0.208*	-0.025	0.132
Memory loss	45	0.572***	0.502***	0.228*
Loss of consciousness	13	0.016	0.086	-0.091
Poor physical health	21	0.418***	0.218*	0.207*
Verbally abused someone	29	0.354***	0.426***	0.257*
Directed racial harassment toward someone	14	0.246*	0.193	0
Threatened someone with harm	16.8	0.277**	0.257*	0.373***
Caused harm to someone else	16.9	0.399***	0.311**	0.204*
Been injured	18.7	0.448***	0.214*	0.290**
Done something dangerous just for fun	28	0.526***	0.433***	0.390***
Damaged property	12	0.362***	0.186	0.034
Poly-drug use	41	0.351***	0.359***	0.037
Had drink spiked	9	0.258**	0.139	0.143
Relationship difficulties with partner, friend or family	17	0.350***	0.132	0.161
Regretted your actions when drinking	24	0.078	-0.003	0.125
Not had enough money because of money spent on alcohol	29	0.546***	0.321**	0.178

*p < .05; **p < .01; ***p < .001

Table 2: Spearman correlations between alcohol-related harms and apprentices AUDIT score (N = 108)

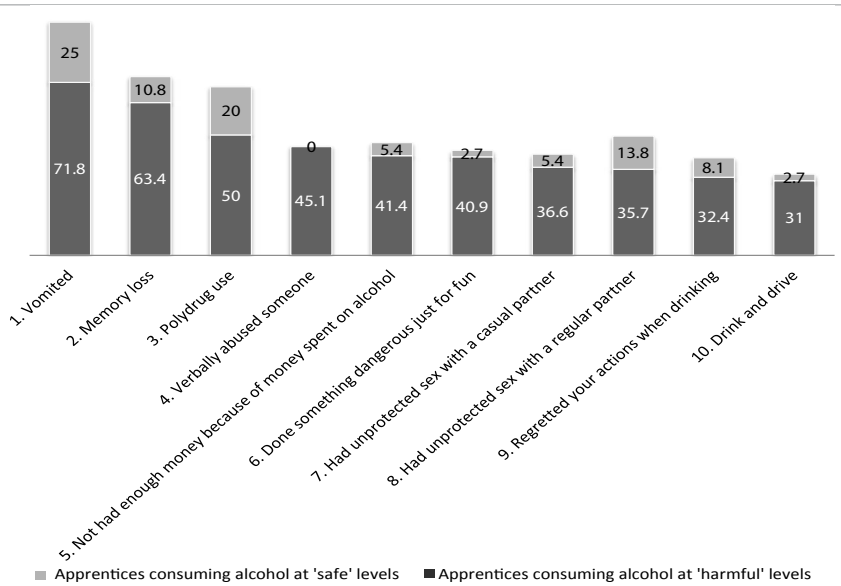

Figure 1: Top 10 alcohol-related harms (%) for apprentices who consume alcohol at 'harmful' (n =71) or 'safe' (n = 37) levels (as distinguished by the AUDIT scale classification)

from other countries where different cultural practices around alcohol consumption might prevail. As is common in this type of self-report research, the data was not verified through observation or compared with alcohol supply data. Previous research indicates that estimates from Australian population surveys (e.g., the National Drug Strategy Household Survey) only account for 50-75% of the consumption estimated by alcohol sales data [16]. The dissimilarity between sales data and population-based surveys might, in general, indicative of under-reporting by participants, or a result of response bias or poor memory recall. This is an inherent problem with self-report surveys, which might apply to this study as well [17].

Apprentices' "missed class" experiences as a result of consuming alcohol, only totaled 6.5%, however, it should be noted that in Australia construction industry apprentices usually attend training colleges either in 'block release' (i.e., one week a month) or 'day release' (i.e., one day a week),while they are at a workplace the rest of the time. Poor performance at training college as a result of consuming alcohol for apprentices was 15%, and a quarter of apprentices also reported poor performance at work as result of consuming alcohol. These findings have implications for doing their jobs safely, as well as retaining their jobs.

As noted in the introduction, harmful levels of alcohol consumption are associated with a range of adverse effects on self and others, such as families, communities and workplaces [14]. Apprentices reported experiencing relationship difficulties with partners, families or friends as a result of their alcohol consumption (17%), and a quarter (24%) reported that they regretted their actions when consuming alcohol. Excess alcohol consumption is also associated with premature death, injury, violence, and motor vehicle accidents [13]. Almost one fifth of apprentices (21%) drove a car after consuming alcohol. Motor vehicle accident fatalities in Australia are overrepresented (25%) among the 17-25 year old age group, yet they only represent 13% of the population [18]. During 2011 in Australia, 30% of casualties in motor vehicle accidents were accounted for by 'drunk driving', and 9% of serious injuries were accounted for by 'drunk driving' [18].

Consuming alcohol lowers inhibitions and impairs judgment [13]. More than a quarter of apprentices had unprotected sex with either a casual partner (26%) or a regular partner (28%), however results for having a sexual encounter that they later regretted were lower (19%). The risk of contracting a Sexually Transmissible Infection (STI), Sexually Transmissible Disease (STD), or unplanned pregnancy, increases with unprotected sex.

Apprentices had high levels of vomiting (56%), memory loss (45%), loss of consciousness (13%) and almost a fifth reported high levels of poor physical health (21%)as a result of consuming alcohol. Rates of reported injury among apprentices as result of consuming alcohol were 19%. Excess alcohol consumption can lead to adverse health outcomes for the individual in the short-term and long-term [13]. As noted in the literature, alcohol consumption has also been causally linked to over 60 medical conditions, including heart problems, increased risk of cancers and cirrhosis of the liver [13].

As a result of consuming alcohol apprentices indicated high levels of verbally abusing someone (29%), directing racial harassment at someone (14%), threatening someone with harm (17%), and causing harm to someone else (17%). Physical violence, and behaviors which are often noted as precursors to physical violence (e.g., verbal abuse, racial harassment and threats of harm), would appear quite high among construction industry apprentices who are consuming alcohol at 'harmful' levels [19]. Almost a third of apprentices did something dangerous for fun (28%) and reported more instances of property damage as a result of consuming alcohol (12%). Some of these risk-taking behaviors are potentially criminal offences which could have significant ramifications for young men and their families. To date there has been a paucity of research on prevalence rates of alcohol-related violence, particularly among apprentices. Thus, evidence of these violence-related harms provides justification for the importance of implementing preventive education campaigns.

A large portion of apprentices (41%) reported poly-drug use as result of consuming alcohol, while 9% of apprentices reported that they had their beverages'spiked'. Drink spiking can be particularly dangerous if someone does not know what substance they have ingested. Poly-drug use often presents at emergency departments of hospitals and can have significant health and medical implications for the individual, including overdose and death [19].

Alcohol is a commodity which often needs to be purchased. For apprentices who (comparatively) earn much less than qualified trades people, the financial cost of purchasing alcohol can be significant. In the current sample almost a third of apprentices report not having enough money as result of money spent on purchasing alcohol (29%).

While many young men experience harms as a result of consuming alcohol, these experiences are not universal, with 15% of apprentices not experiencing any of these alcohol-related harms in the last year. While apprentices were asked about the alcohol-related harms they had experienced, they were not asked about precautions they took to potentially moderate harms [20]. Future research could ask apprentices what precautions they took to moderate alcohol-related harms, as this would place our understanding of alcohol-related harms in a wider context.

Conclusion and Implications for Practice

Almost half of the Australian construction industry apprentices sampled consume alcoholic beverages 2-3 times per week. Of concern is that over a third of apprentices surveyed reported that they consume 10 or more alcoholic beverages on any one occasion, with just over one in five consuming 7-9 alcoholic beverages in any one occasion. The amounts of alcohol consumed place apprentices at risk for both short and long-term harm (i.e., at increased risk for injury or disease as result of alcohol consumption). This is confirmed when looking at apprentices overall AUDIT score, which indicate that almost two thirds were consuming alcohol at 'harmful' levels. Apprentices' AUDIT scores were also correlated to their experience of alcohol-related harms. This implies that it is more likely that apprentices who drink at 'harmful' levels could experience alcohol-related harms.

It is important to raise apprentices' awareness about the associations between 'harmful' levels of drinking and the increased risk for alcohol-related harm. This can be done through preventive education delivered to apprentices in training colleges, as well as through print and social media campaigns. There is significant scope for preventive education campaigns in this space, which, as epidemiological research indicates [21], are not only more cost-effective than treating alcohol-related diseases and injuries, but also likely to lead to a reduction in alcohol-related diseases or injuries.

The *Theory of Planned Behavior* [22] would indicate that positive attitudes towards 'harmful' drinking, subjective and descriptive norms (which assume that peers are engaging and condoning 'harmful' drinking), and lower levels of confidence around avoiding 'harmful;

drinking, all predict intentions to drink at 'harmful' levels (and in turn 'harmful' drinking behavior). Researchers suggest that these constructs (self-efficacy, attitudes and intentions) might all serve as important targets for education and awareness raising campaigns [23]. For example, with regards to subjective and descriptive norms, a study of male German apprentices reported that they overestimated the frequency at which their peers consume alcohol by 45% and overestimated the quantity of alcohol consumed by 40% [24]. While not examined in the current study, it would be fair to assume that similar overestimations are made by Australian apprentices. Thus, presenting an alternate reality to apprentices, and accurate information about how much apprentices actually drink, could help shatter some myths and create an opportunity to change subjective norms. This type of information could, for example, include specific findings from this study on construction industry apprentices, which indicate:

- the percentage of construction industry apprentices who never consume alcohol (10%), or
- who never consume more than 6 alcoholic beverages per occasion (16%), or
- who havenot consumed alcohol in the last two weeks (27%), or
- Who never consume alcohol at 'harmful' levels (34%)

This approach would help apprentices to build their confidence and self-efficacy to better manage drinking practices, and can be implemented through awareness-raising in print materials and through education.

With regards to implementing tailored preventive education campaigns, it is recommended to consider framing messages in the context of days rather than years (i.e., closer to current point of reference). A study [25] was done with 15 to 16 year old Irish high-school students (so in terms of age-group it has some bearing on male construction industry apprentices), and this seems to be the way they conceptualizetime: The closer to their current point of reference (now) the more objective and concrete were their references to time; whereas medium-term (future and past) related more to life-event focused descriptions (a mixture of temporal and objective time periods, for example, 'when I go on holiday', 'when I complete my apprenticeship'), and long-term future and past were predominantly conceptualized in temporal benchmarks, and were more abstract. Thus, if one wanted to create an opportunity for behavioral change in the short-term it would be most effective to frame messages in short-term future reference points and in objective terms, rather than linked to the distant future. For example, 'smoking kills 1000 people per day', rather than 'smoking kills 365,000 people per year'. However, if messages are going to be framed in the medium- to longer-term then they might have greater impact if tied to relevant temporal benchmarks, so, for example, 'by the time you complete your apprenticeship', rather than 'in 4 years' time'[26,27].

With regards to allocation of resources, Australian research indicates that while the $71 million invested in alcohol interventions, such as random breath testing, is a cost-effective measure, implementation of a combination of interventions, such as changes to taxation, banning of alcohol advertising, and licensing controls on operating hours, could contribute to even greater cost savings, while also improving population health 10 fold [22].

The current study looked at young men who are working as apprentices in the construction industry. Theoretical approaches which consider contextual factors [7] highlight the potential for prevention strategies in the workplace and in training colleges. This study indicates that Australian construction industry apprentices are particularly at risk for alcohol-related harm. Raising awareness of the specific risks associated with alcohol use, and education about industry alcohol and drug policies, would seem to be the appropriate first lines of defense to minimize harm.

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